

# SESSION 500®

## Operating Guide

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### GENERAL DESCRIPTION

Three years ago our design group initiated the Session® 500 program. Hundreds of ideas coming from professional musicians, music dealers and field technicians as well as our own staff musicians and electronic/mechanical engineering groups were discussed, evaluated and "distilled" into a concise set of specifications which formed the basis for the new Session®. As the project progressed, we were able to draw from our experience gained in allied areas such as sound reinforcement amplification and the design of new loudspeakers made from the "ground up" in our own speaker/transducer laboratories.

The basic amplifier/speaker system was "road tested" for several months as a "bare bones" prototype and the input we got was that even with the increased power and dynamic range available from the amplifier, the amp could still be overloaded, especially when heavy "power chords" and excessive pedal action were used. During this same period of time, another R & D team had been working on the special problems of **compression** related to sound reinforcement power amps....It was natural for the two R & D teams to combine their efforts and apply our newly developed "Distortion Detection Technique" compression circuitry (patent pending) to even further improve and enhance our musical instrument amplifiers. The resulting power amp used in the Session® features DDT® compression that virtually eliminates amplifier clipping with the resulting harsh harmonics and speaker problems that are often encountered when the amplifier is driven into hard clipping and square waves are delivered to the speaker system.

The new Session® tone controls retain many of the equalization characteristics of the old Session® but now include a unique "state variable" midrange equalizer that enables both boost and cut, as well as shifting of the center point of the midrange equalizer. This capability further enhances the tremendous tonality and dynamic range available from the Session® 500.

To further satisfy the needs of the touring professional, we have designed a variable electronic crossover into the Session's® signal processing circuitry to allow bi-amping the system through auxiliary power amps/speaker systems. By including this "state variable" filter/crossover, we have enabled the Session® 500 to be the "heart" of a bi-amped system capable of performance heretofore unmatched in musical instrument amplification.

It has been recognized for many years that the traditional steel guitar/volume pedal/amplifier arrangement commonly used is definitely **not** the most ideal setup. Analysis showed that certain relatively minor circuit revisions, including some novel gain balancing circuitry, could actually allow the volume pedal to be inserted into the amplifier itself, thus tremendously increasing the overall performance of the system from the standpoint of dynamic range, noise, and freedom from tonal change as the volume pedal is moved throughout its range. For the first time, the Session® 500's innovative circuitry removes the loading effects and resulting tonal changes caused by the volume pedal's interaction with the instrument's pickup.

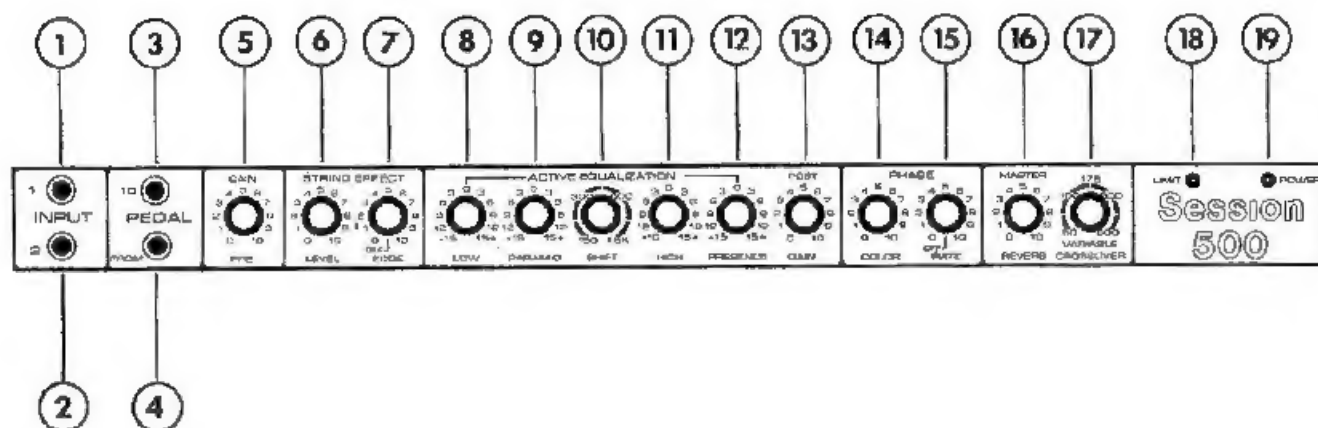
Musicians onstage and in the studio are constantly faced with the problem of "micing" their amplifiers, or using what is popularly referred to as "direct boxes," to get the signals from their instruments into a form compatible with studio or sound reinforcement mixing consoles. In recognition of the fact that the console should be fed a direct signal that corresponds as closely as possible to what's being heard through the speaker system, Peavey has designed a transformer balanced line amplifier with roll-off characteristics virtually identical to those encountered in high powered musical instrument loudspeakers. This unique circuit enables a balanced line level signal output to be obtained from the Session® that closely matches what is being heard from the speaker to be fed to the mixing console....without the use of auxiliary devices such as direct boxes, micing the amp with the additional problems of extraneous noises, feedback, etc., etc.

Further comments from the field indicated the desire for an advanced phasor system that would allow enhanced phasing effects with sufficient range to create and/or simulate the many flange/phasing effects being used in contemporary music. Our circuitry utilizes the latest in semiconductors and computer-aided design techniques and enables a tremendous range of effects from slow, almost imperceptible effects to deep "swooshing" effects so characteristic of studio phasing/flanging units. The extreme range of the phase oscillator yields rates from extremely slow to rapid variations characteristic of tremolo or vibrato.

Another feature often desired by professional steel men is a distortion/string effect with **built-in expander** and noise gate to allow virtually infinite **sustain** with a very quiet standby operation. This circuit can create harmonic effects similar to fiddles as well as previously unavailable string/sustain effects. After considerable investigation into devices currently being used by studio musicians to achieve similar effects, our R & D team devised an **entirely new** type of circuit that features electronic "expansion" combined with a noise gate that yields full and mellow string type sounds that have almost unbelievable sustain. The Session® 400 featured a unique complementary reverb drive which has been retained but refined with new circuitry that allows the drive coil itself to be a part of the negative feedback loop of the drive amplifier. This circuitry allows a tremendous sustain and dynamic range to be obtained from the Accutronics delay line. Comparison with competing models will illustrate its marked superiority.

Steel players have repeatedly asked to have the capability to control the effects and reverb functions remotely. Since both hands and feet are used when playing pedal steel, we devised a "clip on" control box which is designed to clamp on the leg of the steel. This convenient and practical arrangement even further enhances the flexibility of the 500's effects features!

Overall, the Session® 500 truly represents the "state of the art" in musical instrument amplification. Just as the Session® 400 has been accepted by guitarists other than steel players, we feel that the new Session® 500 will be even more desirable to jazz and country players and even rock guitarists desiring almost infinite sustain effects with tremendous tonal control, power output capability, and dynamic range. We invite you to check and compare the Session® 500's features with any amplifier on the market today, regardless of price, and you will readily see that it is truly without peer.



## FRONT PANEL

### INPUTS (1) (2)

The Session® has two inputs, one featuring high gain and the other having half as much gain. The high gain jack (1) is the input normally used unless the signal from your instrument is overloading the input preamp. If your input signal is overloading (distorting) the high gain jack, then the low gain (-6 dB) jack (2) should be used.

Because of the unique "switching" design of the Session's® input circuitry, the gain of both high and low gain jacks balance automatically when instruments are plugged into **both** jacks.

### PEDAL INPUTS (3) (4)

One of the most frequent complaints of steel guitar players is that the tonality of their instrument changes with different positions of the pedal volume control. The reason for this is that a simple pot or control as used in most pedal volume controls causes different impedance loadings on the instrument's output and also on the amp's input. As the pedal control is varied through its range, the various impedances interact with each other to produce the familiar tonal change.

As part of the Session® R & D effort, we were determined to eliminate this tonal variation by enabling the instrument to be plugged directly into the amp, thus matching the pickup with an extremely high input impedance which would not vary as did the pedal volume control. The output from the input preamp was designed to present much higher signal levels and much lower impedance levels to the pedal volume control, while feeding the pedal output back into an extremely high input impedance. The result of this arrangement was to not only eliminate tonal change but also to place a substantial portion of the **gain before the pedal volume**, thus resulting in greatly reduced noise. By placing the input gain stage **before the pedal**, the residual preamp noise (hiss) is attenuated at the same time as the guitar signal. The old system of pedal volume resulted in a **constant** amount of amp noise since the volume pedal was **before** all amplification.

This innovative but simple system is extremely easy to use and requires only two extra patch cables.

1. The instrument is patched **direct** to the Session's® input.
2. Patch from the normal pedal input to the Session's® pedal to jack.
3. Patch a cable from the normal pedal **out** to the Session's® pedal from jack.

### NOTE

**ALL INPUT AND PEDAL PATCHING FUNCTIONS MUST BE PERFORMED USING SHIELDED CABLES.**

While it may take some players a little longer to get used to this new system, the tremendous increase in performance will be well worth the effort.

### PRE GAIN (5)

The input circuitry of the Session® is designed using "variable negative feedback" in order to optimize the input dynamic range, input impedance, and low noise operation. This unique input circuitry utilizes specially selected low noise, high slew rate semiconductors that have been precisely specified for this particularly demanding professional application. The pre gain control is the element that determines the amount of signal that is "fed back" within the input preamp, thereby determining the amount of gain available in the input stage. This system is vastly superior to older designs with fixed gain stages which utilize the level control as a passive element by merely dividing down the output from the preamp circuitry. By regulating the **amount** of amplification actually taking place, this unique circuit configuration eliminates unnecessary noise and distortion while maintaining extremely high input impedance to avoid loading effects on musical instrument pickups. The high degree of stability and relative freedom from intermodulation distortion inherent in this unique input circuitry provide clean signal voltage to the succeeding stages of the Session® 500.

### STRING EFFECT

The Session® 400 was developed as an all-purpose amplifier featuring high power and dynamic range adequate to handle almost any instrument. Steel guitar has always been one of the most difficult instruments to properly amplify, and most steel men felt the Session® 400 was the best amp then available for that demanding application. In working with the Session® 400, various players gave Peavey engineers valuable suggestions as to how the 400 could be improved both in features and performance. One repeated request was for a built-in circuit to allow simulation of a "string section" (fiddles) as was being done by several of the session men in Nashville. We evaluated the various effects units being used for that purpose and obtained much insight into the needed response curves, gain structures, and waveform requirements. Our "string effect" is a unique circuit that features a built-in **expansion** capability to enable **sustain** never before achieved in an instrument amp with a **noise gate** that reduces noise to a very low level during standby operation. This string effect not only simulates violins (fiddles) but is capable of an extremely wide range of effects that make the Session® an unmatched performer for regular electric guitar.

The string effect is actually a kind of "distortion" which can simulate the sound of violins, yet has the added capability of generating the same gain/distortion characteristic of hard rock. This new and versatile feature adds yet another dimension to the performance capability of the Session® and, when combined with its other features, makes the Session® the most technically sophisticated and one of the best performing amps available anywhere.

**NOTE**

**SIMULTANEOUS USE OF VOLUME PEDAL AND STRING EFFECT REQUIRES USE OF SPECIAL VOLUME PEDAL CIRCUITRY.**

The string effect system yields the most satisfactory performance with a **constant** signal from the instrument's pick-up. (Similar to most other add-on effects devices.)

In order to maintain this constant input situation, it is necessary to patch the instrument straight into the high (1) or low (2) gain input of the Session® 500, and then connect the volume pedal to the jacks labeled "To Pedal" (3) and "From Pedal" (4).

Sustain and smoothness of the string effect will be marginal if the special pedal inputs are not utilized. Refer to the appropriate section of this manual for complete details of this patch.

#### **STRING EFFECT LEVEL (5)**

This control determines the level of the string effect when this function is activated by the switch on the edge control and/or the remote footswitch. The level increases as the control is rotated clockwise. In operation, the noise gate opens when the instrument is played and the built-in expansion provides a smooth string sound not duplicated by any other amplifier.

#### **NOTE**

**THE STRING EFFECT CAN BE REMOTELY ENGAGED OR DEFEATED BY USE OF THE LEG SWITCH OR THE OPTIONAL FOOTSWITCH IF AND ONLY IF THE STRING EFFECT CIRCUITRY IS ACTIVATED BY THE SWITCH ON THE "EDGE CONTROL" (7) LOCATED ON THE FRONT PANEL.**

#### **EDGE CONTROL (7)**

This control provides a particular blend of equalization and signal conditioning which serves to enable a wide range of effect variation. Please note that a switch has been provided on this control that cuts off the string effect when in the full counterclockwise position. When this switch is off, the string effect circuitry is not operational and the effect cannot be activated by the remote switch. When the switch is on, the pre gain control (5) is bypassed and overall volume is now adjusted by the string effect level (6).

Overall, the edge control is used to "fine tune" the string effect, and you will find that the tonal texture and smoothness will depend upon the relative setting of the edge control.

Note: At higher settings of the string effect level and/or edge controls, an extreme amount of gain is being developed and slightly increased noise levels are to be expected. Because of the special nature of the string effect, the amp's EQ setting might need adjustment in some cases to provide the exact response necessary. Remember that the edge control was designed to be balanced against the regular EQ controls to further enhance the tonal blend.

#### **EQUALIZATION**

The equalization of the Session® 500 is very similar to that used in the Session® 400. The particular tonal response of this amp has been very carefully tailored to suit the demanding professional, and adequate control margins are allowed to make possible almost any tonal shading or timbre. While the Session® 500's low and high EQ controls are essentially the same as on the Session® 400, we have updated and redesigned the midrange EQ utilizing the latest "state variable filter" technology. This parametric type middle control yields a tremendous range of boost or cut as well as providing the ability to shift the operational frequency center point throughout the vital midrange. We determined in our design program that it is sometimes desirable to allow some degree of "interaction" or "overlap" between the low/mid and mid/high range of frequencies. The frequency shift control (10) has the ability to change the center frequency over an extremely wide range and, when utilized in conjunction with the other EQ controls, allows a virtual rainbow of tonal colors and shadings to be produced. Experimentation will illustrate that the EQ circuitry of your new Session® is unmatched by any musical instrument amplifier available today.

#### **LOW EQ CONTROL (8)**

The low EQ control is of the active "shelving type" and provides low boost in clockwise settings and low cut in counterclockwise settings, while "flat response" is obtained in the vertical (12:00 o'clock) position. The action of this control is more or less "conventional" and no operational problems should be encountered. You should avoid excessive low end boost since this greatly affects your amp's power reserve (headroom). The low EQ control is capable of more than 15 dB of boost and each 3 dB of boost **doubles** the amount of power necessary. It should be apparent that even the Session's® 300 watt power amp can be overloaded by excessive low end boost at high volume levels. Again, **experimentation** and **operating experience** are the keys to achieving maximum performance from your Session®.

#### **PARAMID™ CONTROL (9)**

This control enables a boost or cut to be obtained in the vital midrange frequencies. Added versatility is possible because of the ability to vary the operating center point throughout the midrange by use of the frequency shift control (10). The PARAMID™ control operates in a similar manner to the low and high EQ controls in that it has boost and cut capabilities. Boost is obtained in clockwise settings; cut is obtained in counterclockwise settings; and "flat" operation is obtained in the vertical (12:00 o'clock) position. The vital midrange is the band of frequencies which has the most effect on the "tonal coloring" of the overall sound. Whatever amount of time you spend getting familiar with this important control will be worth the effort, and the "payoff" will be the ability to achieve the exact tonal textures you will use for those important studio bookings and concerts.

#### **FREQUENCY SHIFT (10)**

The Session's® "parametric" type middle equalization enables an extremely wide range of EQ effect. The Session® 400 utilized a "shift" circuit that had a considerable range of operation, but the new 500 has a shift circuit composed of a "state variable filter" which makes possible the shifting of the midfrequency centers over several octaves. This new EQ filter technology gives the player "tonal freedom" never before available in any amp. The sweep capability of this circuit enables the exact midrange frequency to be set, and the associated PARAMID™ control then allows a true boost or cut to be achieved at that frequency setting.

The "state variable filter" changes its operating center frequency upward as the frequency shift control (10) is rotated clockwise. The operation of this control is simple and should present no problems.

**NOTE:** While there are no "recommended settings" for either the PARAMID™ or frequency shift controls, one should remember that overboosting could cause problems with operating "headroom." Generally, it has been found that some degree of midrange cut sounds better than boost with steel guitars, electric piano and bass guitar. For rock guitar, the midrange is often boosted, while the settings of the low EQ is flat or with **light** boost and the high EQ is adjusted for moderate boost. When playing in the "distortion mode" or when using the "string effect," care should be used to avoid overboosting the highs which can cause an unpleasant "harsh" or "strident" response.

#### **HIGH EQ CONTROL (11)**

This control is of the active peak/notch type and provides true boost or cut in lower high frequency ranges (2 KHz). As with the low and PARAMID™ controls, the high EQ produces boost in the clockwise positions and cut in the counterclockwise settings, while flat response is obtained in the vertical (12:00 o'clock) position. The action of this control is conventional but pronounced. Care should be taken not to overboost the highs since this can contribute to unpleasantly harsh response as described above.

#### **PRESENCE CONTROL (12)**

In the Session® 400 program, we discovered that quite often there was something missing even when effective low, mid, and high equalization functions were provided. Because of the particular nature of musical instruments, some sort of presence control quite often can add an unbelievable amount of "body" and richness to the sound. Our "presence" control is of the active (shelving) type and provides very high frequency boost in clockwise settings and very high frequency cut in counterclockwise settings while flat response is obtained in the vertical (12:00 o'clock) position. This presence EQ is not as audibly effective as some of the other EQ controls, but its function is to make available that often needed "presence" (8 KHz) which is so often required in studio applications.

Similar caution applies to the presence control as it does to the high EQ control. Overboosting the presence can cause less than optimum results when using the string effect or when playing hard rock/distortion type material. Experimentation is, again, the key to success in fully realizing the potential of this versatile feature.



## **POST GAIN CONTROL (13)**

This control determines the output level from the Session's® preamp, and its operation is similar to that of conventional "master volume controls." This control is used in conjunction with the pre gain control in order to maximize the signal-to-noise ratio for studio applications and for creating various overload dynamics.

The overall signal-to-noise ratio can be improved by turning the post gain control to settings somewhere in the center of its rotation, combined with appropriate settings of the pre gain control (5). It should be noted that, while this mode of operation decreases residual amp noise, it also decreases the dynamic range of the input preamp. Operation in this manner is suggested for studio and moderate output level applications. Concert applications usually require close-to-maximum settings of the post gain control.

Overload dynamics and distortion may be achieved by turning up the pre gain toward maximum settings while operating the post gain at lower settings. It should be noted that "distortion/overload" type effects can be achieved by the string effect with significantly more control and versatility than is possible by distorting the front end with the above described settings of the pre and post gain controls. Distortion normally should be achieved by the string effect feature.

## **PHASE CIRCUITRY**

The new Session® 500 has an advanced phase circuit designed using the latest semiconductor devices. This advanced circuit features an extremely wide range of operation and actually allows some degree of regeneration or "positive feedback" to occur, thus greatly enhancing the phase effect. The action of this feature is conventional and should present no operational problems.

**NOTE:** The phase rate control is equipped with an on/off switch which activates the phase circuitry. If this switch is off (full counterclockwise), the phase effect cannot be activated by the remote switch.

## **PHASE COLOR CONTROL (14)**

The phase color control is the element which determines the amount of internal feedback that sets the level of the phasing effect. Very subtle changes may be heard in the counterclockwise position, while extremely deep phasing effects with the accompanying characteristic "swooshing" sounds are obtained at the extreme clockwise setting. Because of the unique action of this control, some degree of regeneration is introduced into the circuit in the extreme clockwise ("8" - "9" - "10") positions; you will note the most effect in the last quarter turn.

## **PHASE RATE CONTROL (15)**

The rate control determines the speed of the built-in phase oscillator. You will note that the speed is variable from extremely slow to extremely rapid and covers a far greater range than conventional phase or tremolo oscillators and, in fact, effectively covers the operational range of both types. Counterclockwise settings will produce an extremely slow speed with advancing speed as the rate control is rotated clockwise. Please note that the rate control features an integral switch which is cut off in the full counterclockwise position to allow the phase circuitry to cut completely out of the circuit from the front panel of the amp without the footswitch. Please note that the phase circuitry will **not** work, nor can it be controlled by the remote switch, if the circuit is cut off with the switch on the rate control which takes precedence over the remote footswitch.

### **NOTE**

BECAUSE OF THE MODULATING ACTION OF THE PHASOR, IT IS A GOOD IDEA TO KEEP THE PHASE CIRCUIT TURNED OFF WHEN NOT IN USE, EITHER BY USE OF THE FOOTSWITCH OR WITH THE FRONT PANEL SWITCH ON THE RATE CONTROL, TO AVOID MODULATING THE RESIDUAL NOISE FROM THE INPUT PREAMP; I.E., TURN THE PHASOR OFF WHEN NOT IN USE.

## **REVERB CONTROL (16)**

The Session® utilizes a unique reverb circuit featuring a current source drive wherein the Accutronics reverb unit is included in the overall feedback circuit for maximum frequency response and linearity. The reverb control determines the amount of delayed (reverb) signal mixed back into the output and its operation is conventional. In addition, the reverb level can be adjusted through the use of a remote volume control. The reverb may be activated or defeated through use of the remote switch.

## **VARIABLE ELECTRONIC CROSSOVER CONTROL (17)**

The crossover control serves to set the crossover frequency of the built-in electronic crossover. We have included a variable electronic crossover in order to make bi-amplification possible. Because the Session® 500 has been designed for professionals who must perform for large concerts, the bi-amp capability enables this unit when used with external power and speaker systems to become a truly awesome performer. This capability, combined with the Session's® DDT® compression, gives us even more reason to believe that the Session® is the world's most advanced instrument amp.

## **BI-AMPING**

The purpose of bi-amping is to eliminate various kinds of distortion by maximizing the system's overall dynamic range. This is done by utilizing separate power amps to independently amplify the low and the high frequencies. In systems where the various components are known, such as particular speakers in particular enclosures, it has been common practice to preset the crossover point in order to achieve optimum balance. In musical instrument amplifiers that are used with a wide variety of different speaker systems operated in different sized areas, we felt it was necessary to incorporate a variable electronic crossover to facilitate matching different amp/speaker combinations together into a compatible system. Typically, the internal amplifier is used as one channel of the bi-amp, while an external amplifier is used as the other. As a general rule, the most powerful of the two amps required should be used for the low frequency since this end of the spectrum generally demands more power output than the high end of the spectrum; i.e., if you have an external 400 watt power amplifier, you should use the Session's® internal 300 watt power amplifier as the high end of the system by utilizing a small patch cord and patching from the high out to the power amp in. The low out should then be patched to the input of the external 400 watt power amplifier, with the speaker for the high end being patched into the out jacks of the internal power amplifier and the low frequency speakers patched into the external amp's outputs. The external amp should be gain matched using its level control to set a proper "balance" of highs and lows to compensate for different speaker efficiencies and power amp sensitivities. The proper crossover frequency point should then be determined by experimentation using various crossover frequency settings after the desired channel gain and equalization have been set in the preamp. Obviously, if an external power amplifier with less than 300 watts is used, it should be used for the high end.

The bi-amp connections for both highs and lows are located on the rear panel.

### **CAUTION**

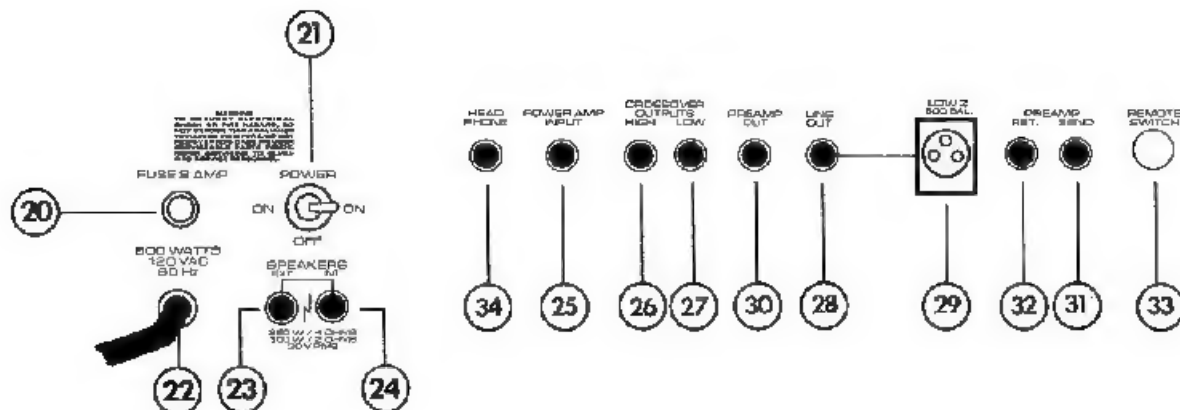
**BE SURE THAT BI-AMP HOOKUPS ARE MADE WITH SHIELDED CABLES.**

## **"DDT" COMPRESSION LED (18)**

The Session® is a compact and powerful amplifier that features a 300 watt RMS power amp with a full complement of equalization controls and a new type of dynamic compression. The compression effect enables us to maximize the performance of the amp/speaker combination. We have determined through much research that the compression circuitry should prevent the power amp/speaker combination from running out of headroom (clipping) and should be as simple to operate as possible to avoid undue complication for the user. Our compression circuitry is very effective. Because of the dynamics and the percussive nature of plucked strings, it is quite common to activate the compression as indicated by the limit LED (light emitting diode) at reasonably low output levels. One should not be concerned that the limit LED indicates compression virtually constantly during a performance since this is what it was designed to do; i.e., to maximize the dynamics available from the amp within its power output capabilities. We have not included other compression controls since we have designed an exclusive "Distortion Detection Technique" (patent pending) which senses conditions that might cause overload, and activates compression **only** when clipping is imminent. This technique effectively utilizes every precious watt available from the power amplifier.

## **PILOT LED (19)**

This light emitting diode (LED) indicates when the amp is switched on and actually drawing from the line (mains) connection. It is totally solid-state and not subject to burnouts as are older incandescent types.



## REAR PANEL

The Session® 500 contains a very complete rear patch panel to allow interface with other audio equipment and effects devices. All outputs and inputs are fully transient protected and should provide more than adequate signal levels to drive auxiliary devices.

### FUSE (20)

The fuse is located within the cap of the fuseholder and must be replaced with one of the proper type and value if it should fail. It is necessary that the proper type and value fuse be used in order to avoid damage to the equipment and to prevent voiding the warranty. If your unit repeatedly blows fuses, it should be taken to a qualified service center for repair.

### POWER SWITCH (21)

On domestic units, the power switch is of the three-position type with the center position being "OFF." This switch has two "ON" positions, one of which is used to ground the amplifier properly. One of the "ON" positions will yield the lowest amount of residual hum or "popping" when the instrument is touched and this is the position which should be used.

On export models, we utilize a simple on/off switch that does not have multiple "ON" positions since the grounding (earthing) conditions in most countries are made positively through standard tamper-proof plug-in systems.

### LINE CORD (22)

For your safety, we have incorporated a three-wire line (mains) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amp without proper grounding facilities, suitable grounding adaptors should be used. Much less noise and greatly reduced shock hazard exist when the unit is operated with the proper grounded receptacles.

### SPEAKER OUTPUTS (23) (24)

To provide impedance matching and to more carefully control the bandpass characteristics, we have designed the Session® to include an output transformer.

The direct jack (23) on the rear panel provides output direct from the power amp and is capable of handling a wide range of load impedances down to, and including 2 ohms. The transformer output jack (24) is designed for 4 to 8 ohm loads.

### POWER AMP INPUT (25)

This is a switching type jack that is normally internally connected to the preamp output. When a patch cable is inserted into this power amp input jack, the cable then becomes the input for the power amp and may be plugged into one of the crossover outputs for bi-amp operation or into an external effects unit for patching purposes.

### ELECTRONIC CROSSOVER OUTPUTS (26) (27)

This high output (26) is the patching point for connection to the power amp/speaker enclosure to be used for the upper range of the bi-amped system. The low output (27) is the patch point for connection to the power amp/speaker enclosure to be used for the low range of the bi-amped system.

### LINE OUT (28)

Many attempts have been made over the years to patch the preamp circuitry of musical instrument amplifiers directly into recording or sound reinforcement mixing consoles. Most of these attempts have been unsuccessful and have resulted in players and soundmen having to utilize forms of what is popularly referred to as a "direct box" which, of course, means further complication, expense, etc. Most previous attempts at patching signals out of musical instrument amplifiers have ignored a very basic fact.....generally poor frequency response from the musical instrument amplifier's speaker system. Most amp manufacturers have compensated for the speaker's poor top end frequency boost to satisfy the player. While this built-in high frequency boost is indeed good for increasing the response from the system, it tends to cause excessive residual noise as well as "strident" or "screechy" tonality in the direct preamp output signal. Our line output has a built-in compensation circuit that very closely matches the roll-off characteristic of a speaker system in order to produce an output signal which corresponds very closely to what's being heard from the speaker system. There is also a roll-off of the extreme low frequencies to avoid overload of the associated console by the "sub" bass signals. This very important feature should prove very helpful in eliminating the need for direct boxes and mic'ing of musical instrument amplifiers. The signal from the line output jack is low impedance (600 ohms) unbalanced at a nominal signal level of -10 dBV (300 mV RMS).

### BALANCED LINE OUT (29)

This XLR output is transformer balanced and provides a line level frequency compensated signal off the internal line amplifier. This signal is low impedance at the same level as the line out (28) and may be fed over considerable distances without signal degradation because of its low impedance balanced output capability.

### PREAMP OUT (30)

This output presents the total output signal from the preamp and may be used for a number of different patching functions. The preamp out may be used to patch various effects devices "in line" between the preamp output (30) and the power amp's input (25). It may also be used whenever an uncompensated post EQ signal is needed for patching or other purposes.

### PREAMP SEND (31) AND RETURN (32)

To allow patching various external effects devices into the Session's® circuitry before or "pre" to the EQ circuitry, we have provided an additional pair of out/in jacks labeled "preamp send" and "preamp return." In operation, a signal is patched from the preamp send jack (31) to the input of the external effects unit, while the output from this external unit is patched back into the preamp return jack (32). Be sure to use good quality shielded cables for this patching function.

### REMOTE SWITCH SOCKET (33)

The remote switch socket is the standard "DIN" type and serves as the amp connection for the supplied remote switch. Please note that the "DIN" plug has an indentation that must be matched with the matching indentation in the switch receptacle on the front panel. This keying action allows the switch to be connected only in the proper manner. If the plug is forced or undue pressure is exerted on the shell or pins, damage could result to the remote switch plug or the chassis mounted socket. As with any precision device, reasonable care should be exercised.

NOTE: If the clip on the remote switch is not suitable, an optional conventional footswitch is available for nominal extra cost.

## HEADPHONE JACK (34)

To round out the Session's® capabilities, we have included headphone capability to enable "tuning up" or practicing where it would be inconvenient or impossible to utilize the amp in a normal manner. This jack is of the stereo (ring-tip-sleeve) variety and has been wired for monaural operation. Adequate level is available to drive headphones with impedances of 4 ohms and above.

### CAUTION

**BE SURE TO LEAVE SUFFICIENT SPACE BEHIND THE SESSION® 500'S HEATSINK TO ALLOW ADEQUATE AIR FLOW. IF THE REAR OF THIS UNIT IS PLACED TIGHTLY AGAINST A WALL OR OTHER OBJECT THAT PREVENTS AIR CIRCULATION AROUND THE HEATSINK, THE THERMAL PROTECTION CIRCUITRY COULD BE ACTIVATED CAUSING A TEMPORARY SHUTDOWN OF THE A.C. POWER SUPPLY UNTIL THE HEATSINK COOLS DOWN TO SAFE OPERATING LEVELS.**

### CAUTION

**BECAUSE OF THE HEAVY CURRENT DEMAND OF THE SESSION® 500, THIS UNIT SHOULD BE PLUGGED DIRECTLY INTO THE WALL RECEPTACLE OR AN EXTREMELY HEAVY-DUTY EXTENSION CABLE.**

## AMP CAUTIONS

### DANGER

EXPOSURE TO EXTREMELY HIGH NOISE LEVELS MAY CAUSE A PERMANENT HEARING LOSS. INDIVIDUALS VARY CONSIDERABLY IN SUSCEPTIBILITY TO NOISE INDUCED HEARING LOSS, BUT NEARLY EVERYONE WILL LOSE SOME HEARING IF EXPOSED TO SUFFICIENTLY INTENSE NOISE FOR A SUFFICIENT TIME.

THE U.S. GOVERNMENT'S OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAS SPECIFIED THE FOLLOWING PERMISSIBLE NOISE LEVEL EXPOSURES:

DURATION PER DAY IN HOURS

8  
6  
4  
3  
2  
1½  
1  
½  
¼ or less

SOUND LEVEL dBA, SLOW RESPONSE

90  
92  
95  
97  
100  
102  
105  
110  
115

ACCORDING TO OSHA, ANY EXPOSURE IN EXCESS OF THE ABOVE PERMISSIBLE LIMITS COULD RESULT IN SOME HEARING LOSS.

EAR PLUGS OR PROTECTORS IN THE EAR CANALS OR OVER THE EARS MUST BE WORN WHEN OPERATING THIS AMPLIFICATION SYSTEM IN ORDER TO PREVENT A PERMANENT HEARING LOSS IF EXPOSURE IS IN EXCESS OF THE LIMITS AS SET FORTH ABOVE. TO INSURE AGAINST POTENTIALLY DANGEROUS EXPOSURE TO HIGH SOUND PRESSURE LEVELS, IT IS RECOMMENDED THAT ALL PERSONS EXPOSED TO EQUIPMENT CAPABLE OF PRODUCING HIGH SOUND PRESSURE LEVELS SUCH AS THIS AMPLIFICATION SYSTEM BE PROTECTED BY HEARING PROTECTORS WHILE THIS UNIT IS IN OPERATION.

### CAUTION

THIS AMPLIFIER HAS BEEN DESIGNED AND CONSTRUCTED TO PROVIDE ADEQUATE POWER RESERVE FOR PLAYING MODERN MUSIC WHICH MAY REQUIRE OCCASIONAL PEAK POWER. TO HANDLE OCCASIONAL PEAK POWER, ADEQUATE POWER "HEADROOM" HAS BEEN DESIGNED INTO THIS SYSTEM. EXTENDED OPERATION AT ABSOLUTE MAXIMUM POWER LEVELS IS NOT RECOMMENDED SINCE THIS COULD DAMAGE THE ASSOCIATED LOUDSPEAKER SYSTEM. PLEASE BE AWARE THAT MAXIMUM POWER CAN BE OBTAINED WITH VERY LOW SETTINGS OF THE GAIN CONTROLS IF THE INPUT SIGNAL IS VERY STRONG.

## POWER AMPLIFIER SECTION: 4006H MODULE WITH DDT® & OUTPUT TRANSFORMER

### FREQUENCY RESPONSE:

+0, -1 dB, 50 Hz to 30 KHz @ 200W RMS into 4 ohms  
@ 2 ohm tap

### RATED POWER & LOAD:

250W RMS into 4 ohms  
300W RMS into 2 ohms

### POWER @ CLIPPING:

(1% THD, 1 KHz, 120 VAC line)

Typically @ 2 ohm tap:

130W RMS into 8 ohms

225W RMS into 4 ohms

320W RMS into 2 ohms

Typically @ 4 ohm tap:

130W RMS into 16 ohms

225W RMS into 8 ohms

260W RMS into 4 ohms

### TOTAL HARMONIC DISTORTION @ 2 OHM TAP:

Less than 0.1%, 200 mW to 200W RMS, 50 Hz to 10 KHz,  
4 ohms, Typically below .05%

### INTERMODULATION DISTORTION @ 2 OHM TAP:

Less than 0.1%, 200 mW to 200W RMS, 50 Hz to 5 KHz,  
4 ohms, Typically below .05%

THE FOLLOWING PREAMP SPECIFICATIONS ARE  
MEASURED WITH ALL EQ FLAT @ 0 dB, POST GAIN FULL  
CLOCKWISE; NOMINAL LEVELS ARE WITH PRE GAIN @  
1200; MINIMUM LEVELS ARE WITH PRE GAIN @ FULL  
CLOCKWISE; FREQUENCY = 1 KHz

### PREAMP INPUT CHARACTERISTICS:

#### JACK A INPUT:

Impedance: High Z, 200K ohms

Nominal Input Level: -28 dBV, 40 mV RMS

Minimum Input Level: -48 dBV, 5 mV RMS

Maximum Input Level: +8 dBV, 2.5V RMS

#### JACK B INPUT:

Impedance: High Z, 44K ohms

Nominal Input Level: -22 dBV, 80 mV RMS

Minimum Input Level: -40 dBV, 10 mV RMS

Maximum Input Level: +14 dBV, 5V RMS

### PEDAL FROM INPUT:

Impedance: High Z, 470K ohms

Nominal Input Level: -12 dBV, 250 mV RMS

This input provides 8 dB of extra gain when a plug is inserted into the jack.

### EFFECTS RETURN INPUT:

Impedance: High Z, 470K ohms without pedal

Bridged with pedal Impedance when used

Nominal Input Level: 6 dBV, 0.5V RMS, no pedal

### POWER AMP INPUT:

Impedance: Medium Z, 22K ohms

Nominal Input Level: 0 dBV, 1V RMS

### SIGNAL-TO-NOISE RATIO:

60 dB, Nominal input level, 20 Hz to 20 KHz unweighted

### EQUALIZATION:

+15 dB @ 80 Hz & 8 KHz, Shelving

+15 dB @ Mid & 2 KHz, Peak/Notch

Mid is shiftable from 150 Hz to 1,500 Hz

### CROSSOVER:

12 dB/octave adjustable from 50 Hz to 500 Hz

### SIGNAL OUTPUT CHARACTERISTICS:

#### EFFECTS SEND OUTPUT & PEDAL TO OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: -6 dBV, 0.5V RMS

Maximum Output: +18 dBV, 8V RMS into 60K ohms

Maximum Output: +16 dBm, 5V RMS into 600 ohms

Pedal to output affected by external effects unit

#### PREAMP OUTPUT & CROSSOVER HIGH OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: 0 dBV, 1V RMS

Maximum Output: +18 dBV, 8V RMS into 50K ohms

Maximum Output: +16 dBm, 5V RMS into 600 ohms

#### CROSSOVER LOW OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: +6 dBV, 2V RMS

Maximum Output: +18 dBV, 8V RMS into 50K ohms

Maximum Output: +16 dBm, 5V RMS into 600 ohms

#### LINE OUTPUT & BALANCED LINE OUTPUT:

Load Impedance: 600 ohms or greater

Nominal Output: -10 dBV, 300 mV RMS

Maximum Output: +10 dBV, 3V RMS into 50K ohms

Maximum Output: +8 dBm, 2V RMS into 600 ohms

### POWER REQUIREMENTS: (Domestic)

800W, 120 VAC, 50/60 Hz

Specifications are subject to change without notice.



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